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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,337	12/23/2003	Takako Takasu	740756-2691	5581

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EXAMINER

YAMNITZKY, MARIE ROSE

ART UNIT PAPER NUMBER

1774

DATE MAILED: 08/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/743,337

Applicant(s)

TAKASU ET AL.

Examiner

Marie R. Yamnitzky

Art Unit

1774

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 July 2006 and 04 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 17-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 17-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date rec'd 04 Aug 2006.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

Art Unit: 1774

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on July 05, 2006 and August 04, 2006 have been entered.

2. Applicant's amendment filed July 05, 2006 amends claims 1, 4-7, 9-11, 13, 19 and 20, and provides a substitute abstract.

Claims 1-14 and 17-20 are pending.

3. The objection to the disclosure as set forth in the Office action mailed April 05, 2006 is overcome by the substitute abstract.

The rejection of claims 5, 7 and 10 under 35 U.S.C. 112, 2nd paragraph, is overcome by claim amendment. (The examiner notes that the amendment to line 4 of claim 5 has introduced an error. What is now the second occurrence of "fourth" should be changed to --third--.)

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-12, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhuang et al. (US 6,602,395 B1) in view of Tada et al. in *J. Phys. D: Appl. Phys.*, Vol. 30, pp. 2063-2068 (1997), or Sarker et al. in *Synthetic Metals*, Vol. 113, pp. 151-154 (2000) or Pei et al. in *Macromolecules*, Vol. 33, pp. 2462-2471 (2000).

See the entire patent to Zhuang et al. In particular, see column 1, line 8-c. 2, l. 43, c. 3, l. 35-65, c. 8, l. 33-c. 10, l. 22 and the Figures.

Zhuang et al. disclose light-emitting displays made by electrolytic polymerization. Zhuang et al. teach that copolymers comprising thiophene units and aromatic units may be used as the light-emitters, and that multi-colored displays may be made by using different polymers having different light-emitting characteristics. Zhuang et al. also teach that it was known in the art at the time of the invention that multi-colored displays could be provided by methods other than electrolytic polymerization.

Zhuang et al. do not disclose a specific example of a polymer meeting the limitations of the polymer required by present independent claims 1, 2, 4, 6, 9 and 11, and claims dependent therefrom, but the required polymer is within the scope of polymers provided by polymerization of monomers of the third formula shown in column 9.

Each of the prior art references to Tada et al., Sarker et al. and Pei et al. discloses polymers similar to polymers made from monomers of the third formula shown in column 9 of the Zhuang patent, and similar to the polymers required by the present claims, and teach the use of the polymers as light-emitters in light-emitting devices having a pair of electrodes sandwiching the light-emitter.

In the article by Tada et al., for example, see Figure 1 on page 2064, and see the full paragraph in the second column on p. 2064. In the article by Sarker et al., for example, see poly-1, poly-2, poly-3 and poly-4 in Fig 2 on page 152, see the two full paragraphs in the first column on p. 152, and see Fig. 3 on p. 152. In the article by Pei et al., for example, see 3a-f in Scheme 1 on page 2465 and see the section titled "Light-Emitting Diodes from the Polymers", which begins on p. 2469.

The polymers disclosed by Tada et al., Sarker et al. or Pei et al. differ from the polymers required by the present claims in that the prior art polymers have none or one of the substituents R_7/R_8 as defined in the present claims. Based on the teachings of Zhuang et al., one of ordinary skill in the art at the time of the invention would have reasonably expected that similar polymers having two substituents on the thiophene unit, particularly alkyl or aryl substituents, would be electroluminescent polymers and could be used for the same purpose.

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize copolymers within the scope of Zhuang et al. and similar to those taught by Tada et al., Sarker et al., or Pei et al., to provide light-emitting displays such as described by Zhuang et al. It would have been within the level of ordinary skill of a worker in the art at the time of the invention to select suitable polymers from known polymers and derivatives thereof to make a multi-colored light-emitting display by Zhuang's electrolytic polymerization. Guided by Zhuang's teachings, it would have been a matter of routine experimentation to determine suitable monomers capable of being electrolytically polymerized to make a display according to Zhuang's method.

The third formula in column 9 of the Zhuang patent defines a relatively narrow group of possibilities for the heterocyclic rings, the narrow group encompassing the thiophene repeating units of formula (b-1) as defined in the present claims. The third formula in column 9 of the Zhuang patent is relatively broad with respect to the conjugated functionality that connects the two heterocyclic rings, but the secondary references demonstrate that copolymers having a benzene repeating unit of formula (a-1) as defined in the present claims connecting two thiophene units similar to the unit of formula (b-1) were known in the art at the time of the invention to be useful for the same purpose as Zhuang's copolymer. Further, Zhuang et al. teach that repeating units of present formula (a-1) can be electropolymerized to form a polymeric electroluminescent emitter (see the second formula in c. 9), and repeating units of present formula (b-1) can be electropolymerized to form a polymeric electroluminescent emitter (see the first formula in c. 9 wherein $X = S$). One of ordinary skill in the art at the time of the invention would have reasonably expected that copolymers could be formed by electropolymerizing monomers of the first and second formulae in c. 9 of the Zhuang patent.

6. Claims 13, 14, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhuang et al. (US 6,602,395 B1) in view of Tada et al. in *J. Phys. D: Appl. Phys.*, Vol. 30, pp. 2063-2068 (1997), or Sarker et al. in *Synthetic Metals*, Vol. 113, pp. 151-154 (2000) or Pei et al. in *Macromolecules*, Vol. 33, pp. 2462-2471 (2000), as applied to claims 1-12, 17 and 18 above, and further in view of Kamatani et al. (US 2003/0059646 A1).

Zhuang et al. provide pixellated light-emitting displays. The paragraph bridging columns 1 and 2 of the Zhuang patent indicates that there are conventional matrix-addressing schemes, but Zhuang et al. do not specifically describe the additional features required by present claims 13, 14, 19 and 20.

Data signal lines, scan signal lines, and nonlinear elements such as thin film transistors, are not novel components of pixellated light-emitting displays. For example, see the Figures in the published application of Kamatani et al.

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to provide pixellated light-emitting displays as taught by Zhuang et al., and to include components known in the art of pixellated light-emitting displays, such as the electrical components disclosed for the pixellated light-emitting displays described by Kamatani et al.

7. Applicant's arguments filed July 05, 2006 have been fully considered but they are not persuasive.

Applicant argues that one would not select the polymer of the present independent claims for the electroluminescent polymer even if the polymers of Tada, Sarker or Pei are similar because the present polymer has difficult solubility because "R₇ and R₈ are a large structure and do not include a polar group, such as oxygen (O) or sulfur (S)." Applicant argues that it is necessary to solubilize the electroluminescent material of Tada, Sarker or Pei whereas the present polymer can be polymerized by electrolytic polymerization.

Applicant's arguments regarding R_7 and R_8 are not persuasive as the present claims do not limit the size of the substituents represented by these variables. Applicant's arguments regarding a polar group, oxygen and sulfur are confusing because the present claims expressly encompass substituents comprising oxygen and/or sulfur, and do not exclude polar groups. Applicant's arguments regarding a polar group, oxygen and sulfur are also not persuasive because none of the cited prior art references require R_7 and/or R_8 to be a polar group and/or to comprise oxygen or sulfur. Zhuang's copolymers have alkyl and/or aryl substituents on the thiophene units. Tada's copolymer has no substituents on the thiophene units. Sarker's copolymers have no substituents on the thiophene units or have one aryl substituent on the thiophene units. Pei's copolymers have one alkyl substituent on the thiophene units.

Applicant's arguments regarding solubilizing versus electrolytic polymerization are not persuasive because the present claims are not limited to the method by which the polymer may be polymerized. The copolymers disclosed in the prior art references are within the scope of copolymers which can be formed by electrolytic polymerization as disclosed in the application as originally filed. Further, Zhuang et al. and Sarker et al. expressly teach electrolytic polymerization.

8. Miscellaneous:

Claim 5, line 2: "element" should read --elements--.

Claim 5, line 4: "fourth" (second occurrence) should be changed to --third--.

Art Unit: 1774

Claim 9, line 3: "at" should be deleted. (This word was deleted in the amendment filed January 19, 2006, but is included in the claim text in the amendment filed July 05, 2006.)

9. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 6:30 a.m. to 4:00 p.m. Monday, Tuesday, Thursday and Friday, and every other Wednesday from 6:30 a.m. to 3:00 p.m.

The current fax number for all official faxes is (571) 273-8300. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

MRY
August 22, 2006



MARIE YAMNITZKY
PRIMARY EXAMINER

1774